

WHAT IS CLAIMED IS:

1 1. A removable dental positioning appliance comprising:
2 a polymeric shell in the shape of an arch having cavities shaped to receive and
3 reposition teeth from a first orientation to a successive orientation;
4 a wire mounted on or embedded in the polymeric shell to span at least a
5 portion of the arch of the polymeric shell.

1 2. A removable dental positioning appliance as in claim 1, wherein the
2 wire is embedded in the polymeric shell.

1 3. A removable dental positioning appliance as in claim 1, wherein the
2 wire is mounted on the polymeric shell.

1 4. A system for repositioning teeth from an initial tooth arrangement to a
2 final tooth arrangement, said system comprising a plurality of dental incremental position
3 adjustment appliances including:

4 a first appliance having a geometry selected to reposition the teeth from the
5 initial tooth arrangement to a first intermediate arrangement;

6 one or more intermediate appliances having geometries selected to
7 progressively reposition the teeth from the first intermediate arrangement to successive
8 intermediate arrangements; and

9 a final appliance having a geometry selected to progressively reposition the
10 teeth from the last intermediate arrangement to a successive tooth arrangement, wherein the
11 appliances comprise polymeric shells having cavities in the shape of an arch, wherein the
12 cavities of successive shells have different geometries shaped to receive and resiliently
13 reposition teeth from one arrangement to a successive arrangement, wherein at least some of
14 the polymeric shells have a wire mounted on or embedded in the polymeric shell to span at
15 least a portion of the arch of the polymeric shell.

1 5. A system as in claim 4, wherein the tooth positions defined by the
2 cavities in each successive appliance differ from those defined by the prior appliance by no
3 more than 2 mm.

1 6. A system as in claim 4, comprising at least two intermediate
2 appliances.

1 7. A system as in claim 6, comprising at least ten intermediate appliances.

1 8. A system as in claim 7, comprising at least twenty-five intermediate
2 appliances.

1 9. A generally horseshoe shaped clear flexible resilient plastic wire-
2 imbedded orthodontic appliance for an upper arch or a lower arch of a patient, comprising: a
3 plastic portion with a lingual side, a labial side, a left molar area, a right molar area, a left
4 canine area and a right canine area, including: contours on the lingual side and on the labial
5 side, wherein the contours snugly cover the patient's teeth so that the appliance remains in
6 place over the patient's teeth and so that the plastic portion guides the force of one or more
7 flexible wires imbedded within the lingual side of the plastic portion; and one or more
8 flexible wires imbedded within the lingual side of the plastic portion, extending from the left
9 molar area to the right molar area of the plastic portion, whereby the wires apply force on the
10 lingual side of the patient's bite to rapidly correct the orientation of the teeth in the patient's
11 bite.

1 10. The appliance of claim 4, wherein the plastic portion covers the surface
2 of the patient's teeth from the left molar to the right molar.

1 11. The appliance of claim 4, wherein the plastic portion comprises a first
2 outer section that covers the entire surface of the patient's teeth from approximately the left
3 molars to the left canines, a second outer section that covers the entire surface of the patient's
4 teeth from approximately the right molars to the right canines, and a middle span that covers
5 only the labial side of the patient's teeth approximately between the canines, whereby the
6 middle span acts as a guide for the force of the wire upon the patient's teeth.

1 12. The appliance of claim 4, wherein the plastic portion further comprises
2 a first outer section that covers the entire surface of the patient's teeth from approximately the
3 left molars to the left canines, and a second outer section that covers the entire surface of the
4 patient's teeth from approximately the right molars to the right canines, whereby the plastic
5 portion does not touch the patient's teeth approximately between the patient's canines.

1 13. The appliance of claim 4, wherein a plurality of vertically parallel
2 wires is imbedded within the lingual side of the plastic portion.

1 14. The appliance of claim 13, wherein the vertically parallel wires have a
2 shape which optimize the force applied to the patient's teeth.

1 15. The appliance of claim 14, wherein the vertically parallel wires are
2 rectangular in cross-section.